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FLORAE MALESIANAE PRAECURSORES LIV. APOCYNACEAE III

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9. ALSTONIA R. BR.

Monograph: Monachino, Pacif. Sc. 3 (1949) 133—182.

About 40 species, 2 in Central Africa, the others from India to SW. China and through the whole of Malesia till northern Australia, the Solomon Islands, New Caledonia, the New Hebrides, the Fiji-, Samoa-, Cook-, Society-, and Marquesas Islands.

Almost all Malesian Alstonias prefer wet ground, some even peat swamp forests, and tolerate open water. They are frequent to common in lowland rain forests, some in mountain rain forests too.The most widely distributed species, *A. scholaris* and *A. spectabilis*, have a wider range of water requirement, occurring also in sclerophyllous woods and wood patches in savannas.

Because of their frequency and characteristic habit the Alstonias have obtained a popular generic name: *pulai*.

The leaf shape is extremely variable in this genus. On the same twig, and even in the same whorl, the leaves may vary from obovate and obtuse to elliptic and acuminate. Sometimes, after the fruits have shed their seeds, short shoots with much smaller leaves spring between the branches of the inflorescence from the axils of fallen leaves. The inflorescence is terminal, pleiochasial, short-peduncled or often sessile, its branches springing from the axils of small scales; these partial inflorescences have a long peduncle and 1—3 nodes giving rise to secondary cymes.

KEY TO MALESIAN FLOWERING SPECIMENS

1. Leaves velvety-papillose and pale below, in whorls of 4—8, lateral nerves numerous (*ca.* 40—100 pairs), straight, 1—4(—5) mm distant. Flowers predominantly yellow. Corolla lobes overlapping to the left. Seeds obtuse at both ends, their borders glabrous or very short-haired
   section **Pala** (Adr. Juss.) Benth.
   2. Corolla obtuse in bud, pubescent outside, at least in the upper part, lobes suborbicular, 2—4 mm in diam.
      Leaves above when dry with distinct tertiary reticulation . . . . **1. A. scholaris**
   2. Corolla obtuse or acutish, glabrous outside, lobes oblong-ovate, 3—8(—11.4) mm long. Tertiary reticulation of leaves in dry state very indistinct or none.
      3. Inflorescence branches with 2 nodes of crowded flowers and subsessile ramifications. Pedicels 0—3 mm. Calyx hirtellous. Corolla bud conspicuously obtuse. Follicles pubescent, at last glabrate. Lateral nerves of leaves patent.
         4. Leaves elliptic, subacuminate or obtuse. Follicles puberulent to glabrous **2. A. angustiloba**
         4. Leaves spathulate, rounded or retuse. Follicles puberulent **3. A. pneumatophora**

3. Inflorescence branches loose, with stalked ramifications. Pedicels 2—10 mm. Calyx glabrous. Corolla bud obtuse or acutish. Follicles glabrous or nearly so.
   5. Leaves spathulate, obtuse. Inflorescences stout. Corolla bud conspicuously obtuse, corolla tube shorter than or as long as the lobes. Angle between lateral nerves of leaves and midrib *ca.* 80° . . . . **4. A. spatulata**
   5. Leaves lanceolate, acute or subobtuse. Inflorescences slender. Corolla bud less obtuse, slender, corolla tube longer than the lobes. Angle between lateral nerves and midrib of leaf *ca.* 70°. . . . . **5. A. actinophylla**

1. Leaves not velvety-papillose below, in whorls of 3 or 4 or decussate, lateral nerves less numerous (*ca.* 10—20 pairs), more or less arcuate, (4—)8—15 mm distant. Flowers white or cream-coloured. Corolla lobes overlapping to the right. Seeds acuminate at the upper end, their borders long-haired . . . . . section **Monuraspermum** Mon.
   6. Calyx urceolate, its lobes reflexed, tomentose inside and outside, broader than long, 0.5—1 mm high, cup 1—2 mm high.
      7. Corolla outside tomentose, its lobes nearly orbicular, 1.5—2 × 1.5—2.5 mm, their bud globose, as broad as the tube . . . . **6. A. angustifolia**
      7. Corolla outside nearly glabrous, its lobes oblong, 3.7—5 × 1.4—2.9 mm, their bud oblong, slightly narrowed towards the top. . . . . **7. A. parvifolia**
   6. Calyx turbinate, its lobes reflexed or not, longer than or as long as the cup.
      8. Calyx and corolla outside white-tomentose. Corolla lobes completely tomentose inside. Petioles mostly long, (5—)15—20 mm*).
         9. Calyx lobes ovate, 1—2 mm, often reflexed, inside laxly hairy to subglabrous. Corolla lobes ovate, obtuse, 1.5 × 1—1.2 mm. Leaves often 5—8 cm broad **8. A. spectabilis**
         9. Calyx lobes oblong, 2 mm, not reflexed, inside tomentose. Corolla lobes linear-oblong, acute, 3—4 × 0.7 mm. Leaves mostly 2—3 cm broad. **9. A. muelleriana**
      8. Calyx lobes glabrous to laxly puberulous, ciliate. Corolla glabrous outside, its lobes with hairs inside in the lower half. Petioles mostly shorter, 3—15 mm*).
         10. Corolla lobes oblong, acutish, 4—7 mm.
            11. Leaves mostly oblong-lanceolate, ratio *ca.* 3—4, 8—30 × 3—9 cm. Calyx laxly puberulous, its lobes broad-ovate, 0.5—0.75 mm high, 1 mm broad, cup 0.5—1 mm high. . . . . **10. A. macrophylla**
            11. Leaves obovate to oblanceolate, ratio *ca.* 2—3, 6—19 × 2—8 cm. Calyx glabrous or nearly so, its lobes ovate, 1 × 1 mm, cup 1 mm high. **11. A. brassii**
         10. Corolla lobes ovate, obtuse, 1.5—3 mm . . . . . **12. A. glabriflora**

KEY TO MALESIAN FRUITING SPECIMENS

(the measurements of fruit breadth refer to closed follicles)

1. Leaves with numerous straight lateral nerves mutually 1—3(—5) mm distant, pale to white-papillose below.
   2. Leaves chartaceous, broadly lanceolate, 5—12 × 1—3 cm. Infructescence glabrous, lax, with slender branches and pedicels. Follicles glabrous, 200 × 3 mm. **5. A. actinophylla**

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*) In New Guinea and Waigeo occur presumable hybrids *A. brassii x spectabilis* with intermediate floral characters. See page 29.

2. Leaves coriaceous, spathulate or broad-elliptic.
   3. Ripe follicles glabrous or nearly so, 4—6 mm broad.
      4. Leaves spathulate, obtuse, 5.5—9 × 1.5—4.5 cm, tertiary reticulation indistinct above. Branches of infructescence with 2 nodes, glabrous, pedicels 5—10 mm long. Calyx lobes obtuse, glabrous. Follicles 250 mm long **4. A. spatulata**
      4. Leaves elliptic to oblanceolate, short-acuminate, 7—28 × 2—11 cm, tertiary reticulation distinct above (in dry state). Branches of infructescence thyrsoid, often with more than 2 nodes, pubescent, pedicels 3—6 mm long. Calyx lobes acuminate, hirsute. Follicles 500 mm long. . . . . **1. A. scholaris**
   3. Ripe follicles pilose, 3—4 mm broad (glabrate in old empty fruits). Tertiary reticulation of leaves indistinct above.
      5. Leaves elliptic, acuminate, rarely obtuse, 7—23 × 3—8 cm. Follicles pubescent to glabrate, 200 × 4 mm . . . . **2. A. angustiloba**
      5. Leaves spathulate, obtuse, 4—11 × 2—4.5 cm. Follicles pubescent, 170 × 3 mm . . . . **3. A. pneumatophora**

1. Leaves with spaced lateral nerves 5—15 mm distant, not pale papillose below. Follicles glabrous.
   6. Leaves oblong-elliptic or oblong-obovate, 12—30 × 3—8 cm. Calyx lobes pubescent, broad, 1—1.5 mm long. Follicles 4 mm in diam.. . . . . . **10. A. macrophylla**
   6. Leaves elliptic or obovate.
      7. Leaves conspicuously acuminate or acute, mostly elliptic or oblanceolate. Calyx lobes, if preserved, forming merely an annular rim.
         8. Leaves decussate or in whorls of 3, 8—19 × 2—8 cm. Follicles 3 mm in diam. **6. A. angustifolia**
         8. Leaves in whorls of 3 or 4, 8—15 × 2—5.5 cm. Follicles 4—5 mm in diam. **7. A. parvifolia**
      7. Leaves shortly acuminate or obtuse, elliptic or often obovate. Calyx lobes, if preserved, 1—2 mm long, distinctly separated.
         9. Petioles (5—)15—20 mm. Infructescenses with remnants of a tomentose indument. Calyx lobes pilose, 1.5—2 mm long.
            10. Leaves 9—15 × 1.5—3 cm. Infructescences slender, their ends lax, the fruits therefore spaced. Follicles 3 mm in diam.. . . **9. A. muelleriana**
            10. Leaves 10—30 × 1.5—3 cm. Infructescences stout, their ends condensed, the fruits therefore agglomerated. Follicles 4 mm in diam. **8. A. spectabilis**
         9. Petioles 5—15 mm. Infructescences glabrous. Calyx lobes glabrous, 0.5—1 mm long.
            11. Leaves long-acuminate, 12—18 by 4—8 cm. Follicles 3—4 mm across **11. A. brassii**
            11. Leaves short-acuminate or obtuse, 6—19 by 2—8 cm. Follicles 4—6 mm across . . . . **12. A. glabriflora**

1. Alstonia scholaris (L.) R. Br.

A. scholaris (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1 (1811) 76; Bl., Bijdr. (1826) 1036; Decne, Herb. Timor. Descr. (1835) 50; G. Don, Gen. Hist. 4 (1838) 86; A. DC., Prodr. 8 (1844) 408; Hassk., Flora 28 (1845) 299, *sphalm.* 267; Miq., Fl. Ind. Bat. 2 (1856) 436; Sum. (1860) 229, 555; F.-Vill., Novis. App. (1880) 129; Hook. *f.*, Fl. Br. Ind. 3 (1882) 642; Forbes, Wand. (1885) 510; Vidal, Phan. Cuming. (1885) 126; Rev. Pl. Vasc. Filip. (1886) 183; K. & V., Bijdr. 1 (1894) 116; Koord., Minah. (1898) 527; Boerl.,

Handl. 2 (1899) 395; Bull. Inst. Bot. Btzg. 5 (1900) 15; Ridl., J. Str. Br. R. As. Soc. 33 (1900) 110; K. Sch. & Laut., Fl. Schutzgeb. (1901) 501; Becc., For. Born. (1902) 580; Merr., Bull. Bur. For. Philip. 1 (1903) 49; Philip. J. Sc. 1 (1906) Suppl. 116; K. & G., Mat. Fl. Mal. Pen. (1907) 436; Merr., Fl. Manila (1912) 372; Koord., Exk. Fl. Java 3 (1912) 72; Atlas 1 (1913) t. 77; Merr., Int. Rumph. (1917) 427; Sp. Blanc. (1918) 308; En. Born. (1921) 497; Troup, Silvicult. Ind. Trees 2 (1921) 668; White, Proc. R. Soc. Queensl. 34 (1922) 49; Ridl., Fl. Mal. Pen. 2 (1923) 346; Merr., En. Philip. 3 (1923) 323; Lane-Poole, For Res. (1925) 134; Heyne, Nutt. Pl. ed. 2 (1927) 1277; Tsiang, Sunyatsenia 2(1934) 97; Kanjilal, Fl. Assam 3 (1939) 253; Corner, Ways. Trees (1940) 140; Kanehira & Hatus., Bot. Mag. Tokyo 55 (1941) 489; Pichon, Bull. Mus. Hist. Nat. Paris II, 19 (1947) 296; Monach., Pacif. Sc. 3 (1949) 146; Meijer-Drees, Comm. For. Res. Inst. 33 (1951) 35; Francis, Austr. Rain For. Trees (1951) 452; Quis., Med. Pl. Philip. (1951) 721; Womersley & Mac Adam, For. Papua & New Guinea (1957) 23, 51; Koning-Vrolijk *et al.*, Nova Guinea Bot. 10 (1962) 157; Hegnauer, Chemotax. 3 (1964) 145, 152; Wyatt-Smith & Kochummen, Mal. For. Rec. 17 (1965) 72; Smythies, Common Sarawak Trees (1965) 19; Backer & Bakh. *f.*, Fl. Java 2 (1965) 226; Burk., Dict. (1966) 114; Van Royen *et al.*, Man. For. Trees Papua & N.G. 9 (without year) 9; Peekel, Fl. Bismarck Arch. (msc.) 1425. — [*Pala* Rheede, Hort. Malab. 1 (1678) 81, t. 45.] — [*Lignum scholare* Rumph., Herb. Amboin. 2 (1741) 246, t. 82.] — *Echites scholaris* L. Mant., (1767) 53. — *Tabernaemontana alternifolia* Burm., Fl. Ind. (1768) 69 *p.p.* — *Echites pala* Ham., Trans. Linn. Soc. 13 (1822) 518.

var. **scholaris**

Leaves glabrous.

Distribution. From India and Ceylon through Burma, Thailand, and Indo-China to Yunnan and through Malesia till the Philippines and the Liukiu Is., New Guinea, Queensland, the Bismarck Arch., and the Solomon Is.

Documented by many specimens from the whole area.

var. **velutina** Monach., Pacif. Sc. 3 (1949) 150.

Leaves strigillose-pilose below.

MALAY PENINSULA. Pahang. *SF 24680*, Tekal.

BORNEO. Sarawak. *S 25521*, Tarat. — Brunei. *BRUN 5407*, J. Tutong. — East. *Kostermans 6772*, Lao Haur (W. of Samarinda).

NEW GUINEA. West. Holtekang: *BW 2651, 2652, 2654*. — East. Morobe Distr.: *Clemens 7971*, Sio. — Central Distr.: *Schodde 2472*, Brown R., Karema.

2. **Alstonia angustiloba** Miq.

A. angustiloba Miq., Fl. Ind. Bat. 2 (1856) 438; K. & V., Bijdr. 1 (1894) 120; K. & G., Mat. Fl. Mal. Pen. (1907) 438; Merr., En. Born. (1921) 497; En. Philip. 3 (1923) 321; Ridl., Fl. Mal. Pen. 2 (1923) 347; Burk. & Hend., Gov. Bull. Str. Settl. 3 (1925) 396; Heyne, Nutt. Pl. ed. 2 (1927) 1276; Hend., J. Mal. Br. R. As. Soc. 17 (1939) 56; Corner, Ways. Trees (1940) 142; Monach., Pacif. Sc. 3 (1949) 152; Bakh. *f.*, Blumea 6 (1950) 393; Browne, For. Trees Sarawak (1955) 63; Smythies, Common Sarawak Trees (1965) 18; Wyatt-Smith & Kochummen, Mal. For. Rec. 17 (1965) 72; Backer & Bakh. *f.*, Fl. Java 2 (1965) 226. — *A. calophylla* Miq., Fl. Ind. Bat. 2 (1856) 439; Sum. (1860) 229. — *A. iwahigensis* Elm., Leafl. 4 (1912) 1447. — *Paladelpha angustiloba* Pich., Bull. Mus. Hist. Nat. Paris II, 19 (1947) 299.

MALAY PENINSULA. Perak. Larut: *King's Coll. 5263, 5270*; s. l. *Wray 4058*. — Pahang. *KEP FRI 12227*, Gap Rd. (sterile, identification uncertain). — Selangor. *Carrick & Enoch s.n.*, Bako Nat. Park, P. Lakei, 2—5—1959 (KLU); *Stone 6060*, Ulu Gombak (KLU). — Negri Sembilan. *Yakim 1987*, Serembau (SING). — Malacca. *Alvins 37*, Bt. Bumang; *805*, Batang Malaka; *Derry 135*, Bt. Sabukor. — P. Penang. *Curtis 3087*, Waterfall; *SF 12699*, Batu Jeringi. — Singapore. *Kas 3*, Mt. Faber; *SF 37007*, Bt. Timah Res. tree no. 29.

SUMATRA. West Coast. *bb 4148*, Padang, Lubuk Perahu. — East Coast. *Bartlett 7251* (sterile, identification uncertain), *8432*, Asahan, Silo Maradja. — Benkulen. *Endert 1065*, Redjang, Bt. Basah. — Palembang. 6 collections. — Simalur. *Achmad 665, 1032, 1086*. — Riouw Arch. *bb 27574*, Kuala Belilas.

JAVA. West. 8 collections. — Central. 6 collections.

BORNEO. Sarawak. *Anderson 8981*, Kuching; *S 178*, Kuching, Semengoh; *S 19497, 21587*, Kuching. — Brunei. *BRUN 5005*, Telamba. — West. *Elsener 201*, Sanggau. — Southeast. *bb 14202*,

Pleihari; *Sauveur 87*, Balikpapan. — East. *Kostermans 6456*, Loa Djanan (W. of Samarinda); *6786*, Loa Haur (ditto); *9559*, mouth of Mahakam R.; *12969*, W. Kutei, Mt. Palimasan near Tabang on Belajan R. — North. 12 collections. — Bangueyl. *SAN 40774*. — Labuan. *Beccari s.n.*, —8—1867 (Fl sh. nr. 6420 & 6421).

PHILIPPINES. Palawan. *Elmer 13167*, Puerto Princesa, Mt. Pulgar.

Note. The shape of the leaves is often very similar to that of *A. scholaris*. Sterile herbarium material can be distinguished with some certainty by the lack of tertiary reticulation and by the lateral nerves which are more closely set (not over 2 mm distant) in the present species.

3. Alstonia pneumatophora Den Berger

A. pneumatophora Backer *ex* Den Berger, Med. Proefst. Thee 97 (1926) 153; Heyne, Nutt. Pl. ed. 2 (1927) 1277; Monach., Pacif. Sc. 3 (1949) 153; Smythies, Common Sarawak Trees (1965) 18. — *A. pneumatophora* var. *petiolata* Monach. l.c.

SUMATRA. Palembang. 13 collections. — Riouw Arch. *bb 9965*, Karimun, Sg. Simpang Kanan.

BORNEO. Sarawak. *Haviland 1689*, Kuching; *S 16414*, Distr. Serian, Sg. Engkabang, 55th mile Simanggau Rd. — Brunei. *BRUN 4236*, Beaufort. — Southeast and East *bb 28080*, Muara Teweh, Pepas; *Kostermans 4537*, Sg. Wain region, N. of Balikpapan; *5883*, E. Kutei, Sg. Kerajaan, N. of Sangkulirang.

CELEBES. Central. Malili: *NIFS Cel III 51*, Usu; *Cel III 120=130*.

Notes. The leaves resemble very much those of *A. spatulata*. The length of the petiole is, as observed by Monachino, an overlapping character, unmistakably distinguishing *A. spatulata* only when more than 7 mm. Another weak character distinguishing A. *spatulata* is the often oblique angle of the lateral nerves. Sterile material of these two species should not be collected.

Monachino's var. *petiolata* from Sumatra shows probably hybrid introgression of *A. angustiloba*. There are specimens from other localities which come near to this variety.

4. Alstonia spatulata Bl. — Plate.

A. spatulata Bl., Bijdr. (1826) 1037; DC., Prodr. 8 (1844) 410; Miq., Fl. Ind. Bat. 2 (1856) 437; Hook. *f.*' Fl. Br. Ind. 3 (1882) 642; Boerl., Handl. 2 (1895) 395; Ridl., J. Str. Br. R. As. Soc. 33 (1900) 110; K. & G., Mat. Fl. Mal. Pen. (1907) 437; Merr., En. Born. (1921) 497; Ridl., Fl. Mal. Pen. 2 (1923) 346; Heyne, Nutt. Pl. ed. 2 (1927) 1279; Kerr, Fl. Siam. En. 2 (1939) 441; Corner, Ways. Trees (1940) 142; Monach., Pacif. Sc. 3 (1949) 153; Browne, For. Trees Sarawak (1955) 63; Anderson, Gov. Bull. Sing. 20 (1963) 190; Hegnauer, Chemotax. 3 (1964) 145; Backer & Bakh. *f.*, Fl. Java 2 (1965) 226; Smythies, Common Sarawak Trees (1965) 19; Wyatt-Smith & Kochummen, Mal. For. Rec. 17 (1965) 72; Burk., Dict. ed. 2 (1966) 116. — *A. cuneata* Wall. [Cat. (1829) n. 1645] *ex* G. Don, Gen. Syst. 4 (1837) 87. — *A. cochinchinensis* Pierre *ex* Pitard, Fl. Gén I.—C. 3 (1933) 1165.

Distribution. Thailand, Indo-China, Malesia.

MALAY PENINSULA. Perak. *Burkill & Haniff SF 13414*, Batu Gajah; *KEP 2159*, Bidor Rd., Tapoh; *King's Coll. 7464*, Larut; *7780*; *Wray 170 bis*, Tapa Batang Padang. — Kelantan. *Corner s.n.*, Kota Bahru, 23—4—1937 (SING). — Trengganu. *SF 40385*, between Kampong Merabong Tengah and Kampong Nibong. — Pahang. *Burkill & Haniff SF 17589*, Beserah. — Selangor. 14 collections. — Malacca. *Alvins 366*, *922*; *Derry 1064*, Tualang; *Maingay 1068*. — Johore. *SF 14380*, Kota Tinggi.

SUMATRA. Tapanuli. *Rahmat 5219*, P. Liman; *5430*, Sopsopau on Aek Si Olip. — West Coast. *Jacobs 4582*, N. of Pajakumbuh, near Harau; *Meijer 4532*, Pajakumbuh, near Batang Agau; *5235*, Pajakumbuh, Sarilamak. — East Coast. *Rahmat 1866*, Rantau Parapat, Bila; *8243*, Asahan, Aer Djoman. — Benkulen. *Rappard 122 DB*, Ds. Besar. — Palembang. *Endert E 823*. — Banka. *bb 15404*, Rias (identification uncertain).

JAVA. West. 6 collections.

BORNEO. Sarawak. 7 collections. — Brunei. *BRUN 5710, 5711*, Penanjong. — West. *Hallier 99*, Soeka Lanting. — South. *bb 18115*, Kuala Kapuas. — NE. *Amdjah 2*, Pladjoe. — North. *A 1296*, Beaufort, Lumat; *NBFD 10137*, Kimanis For. Res. (identification uncertain); *SAN 10759*, Kabili-Sepilok For. Res.; *27324*, K. Kliss, Saratok camp; *30315*, Beaufort, Sampongo.

NEW GUINEA. West. Vogelkop Pen.: *BW 8048*, Kebar Valley. — South: *BW 3229*, Asmat Distr., Erma. — East. Morobe Distr.: 6 collections. — Gulf Distr.: *NGF 8020*, Uramu I.

5. **Alstonia actinophylla** (Cunn.) K. Schum.

A. actinophylla (Cunn.) K. Schum. in E. & P., Nat. Pfl. Fam. IV, 2 (1895) 138. — *Alyxia actinophylla* Cunn., Bot. Mag. (1834) sub tab. 3313. — *Alstonia verticillosa* F. v. M., Fragm. 6 (1868) 116; F. M. Bailey, Austr. Ass. Adv. Sc. (1898) 15; Valeton, Bull. Dép. Agr. Indes Néerl. 10 (1907) 49; Ewart & Davies, Fl. North. Terr. (1917) 222; Markgr., Nova Guinea 14 (1925) 279; Hegnauer, Chemotax. 3 (1964) 145.

Distribution. Queensland, New Guinea.

NEW GUINEA. West. South, around Merauke: *Anta 87, 268*; *Van Royen 4530*; *Versteeg 279*. — East. Western Distr.: 6 collections.

6. **Alstonia angustifolia** DC.

A. angustifolia Wall. [Cat. (1829) n. 1650] *ex* DC., Prodr. 8 (1844) 409; Miq., Fl. Ind. Bat. 2 (1856) 437; Hook. *f.*, Fl. Br. Ind. 3 (1882) 643; Koord., Minah. (1898) 527; Boerl., Handl. 2 (1899) 395; Ridl., J. Str. Br. R. As. Soc. 33 (1900) 110; K. & G., Mat. Fl. Mal. Pen. (1907) 440; Merr., En. Born. (1921) 497; Ridl., Fl. Mal. Pen. 2 (1923) 348; Heyne, Nutt. Pl. ed. 2 (1927) 1276; Merr., Sarawak Mus. J. 3 (1928) 547; Corner, Ways. Trees (1940) 141; Monach., Pacif. Sc. 3 (1949) 159; Browne, For. Trees Sarawak (1955) 65; Smythies, Common Sarawak Trees (1965) 18. — *Amblyocalyx beccarii* Benth. in Hook., Icon. 12 (1876) tab. 1179; Merr., En. Born. (1921) 500. — *A. latifolia* Ridl., Fl. Mal. Pen. 2 (1923) 347. — *A. beccarii* (Benth.) Pich., Bull. Mus. Hist. Nat. Paris II. 19 (1947) 297. — *A. angustifolia* var. *elliptica* K. & G., Mat. Fl. Mal. Pen. (1907) 441. — *A. angustifolia* var. *latifolia* K. & G., l.c.; Monach., Pacif. Sc. 3 (1949) 160.

Distribution. Malesia. A variety reported from Annam.

MALAY PENINSULA. Selangor. *Nur SF 34057*, Klang, Telok For. Res.; *C. Smith KEP 18151*, ditto. — Malacca. *Alvins 925*; *Derry 1080*, Merlimau; *Hassan 13*, Bt. Bruang; *Ridley 3189*, G. Mering, Padang Batu. — Johore. 6 collections. — P. Penang. 9 collections. — Singapore. 18 collections.

SUMATRA. Tapanoeli. *bb 3843*, Silindoeng. — East Coast. *bb 2917*. Simalungun; *Rahmat 8534*, Asahan, Adian Rindang, Huto Tomuan Dolok. — Palembang. *Dumas 1533*, Rawas; *Grashoff 974*, ditto. — Banka. 10 collections.

JAVA. West. *Bakhuizen v. d. Brink 5399*, Bogor, near Tegal Sapi (identification uncertain).

BORNEO. Sarawak. 22 collections. — West. *bb 6328*, Mempawa Toho; *Hallier 1622*, G. Kenepai; *2559*, Smitau. — North. *Clemens 28673, 28673 A, 50392*, Mt. Kinabalu; *SAN 32244, 32355*, Ranau. — Balambangan I. *Tang 1678 A* (SING). — Tarakan I. *Meijer 2536* (SING).

CELEBES. Southwest Peninsula. *bb 21603*, Lamarua. — Southeast Peninsula. *Beccari s.n.*, Kandari (FI sh. 6416, 6417).

Notes. As pointed out by King & Gamble, this species resembles much *A. spectabilis*, especially in its large-leaved forms. Conspicuous characters of *A. angustifolia* are: calyx urceolate, not deeply incised, the lobes 0.5 mm high, 1 mm broad, the cup 1—1.5 mm high, follicles not broader than 3 mm. In *A. spectabilis* the calyx is turbinate, deeply incised, the lobes are 1—1.5 by 1 mm, the cup is 0.5—1 mm high, follicles 4 mm broad.

The occurrence of *A. angustifolia* on Mt. Kinabalu (Borneo) is documented by *Clemens* 28673 and 28673*A* from Tenompok, 1500 m alt. These specimens are attributed by Monachino to the Philippine *A. parvifolia* as 'transitional to *angustifolia*'. Here they are included in *A. angustifolia*; this may be justified by several floral characters: calyx 1.5—2 mm (not 3.5—4), corolla tube tomentose outside (not glabrous), lobes pubescent, 2 by 1.3 mm (not glabrous, 5 by 1.7 mm); the only difference with typical *angustifolia* is in the less

broad and less pilose corolla lobes (2 by 1.3, not 2 by 2 mm; pubescent, not tomentose). Moreover, typical *A. angustifolia* is frequent in Borneo, and also represented at lower altitudes on Mt. Kinabalu (*Clemens 50392*, Gurulau, 1050 m); the above cited specimens seem to represent only a slight variation of higher altitude.

7. Alstonia parvifolia Merr.

A. parvifolia Merr., Publ. Gov. Lab. Philip. 35 (1906) 59; Philip. J. Sc. 1 (1906) Suppl. 116; Tsiang, Sunyatsenia 2 (1934) 100; Monach., Pacif. Sc. 3 (1949) 160.

PHILIPPINES. L u z o n. *BS 42139*, Rizal, Mt. Irig; *Jacobs 7700*, Sierra Madre, NNW. of Dingalan. — N e g r o s. *Elmer 9690*, Dumaguete, Cuernos Mts.

8. Alstonia spectabilis R. Br.

A. spectabilis R. Br., Mem. Wern. Nat. Hist. Soc. 1 (1811) 76; Decne., Herb. Timor. Descr. (1835) 50; DC., Prodr. 8 (1844) 409; Filet, Pl. Bot. Tuin Weltevr. (1855) 65; Miq., Fl. Ind. Bat. 2 (1856) 437; Hemsl., Bot. Chall. I, 3 (1885) 165; Boerl., Handl. 2 (1899) 395; Monach., Pacif. Sc. 3 (1949) 161; Meijer-Drees, Commun. For. Res. Inst. Bogor 33 (1951) 35; Womersley & Mac Adam, For. Papua & New Guinea (1957) 23; Van Royen *et al.*, Man. For. Trees Papua & N.G. 9 (without year) 18. — *A. villosa* Bl., Bijdr. (1826) 1036; DC., Prodr. 8 (1844) 410; Boerl., Handl. 2 (1899) 395; K. Sch. & Laut., Nachtr. (1905) 350; Ewart & Davies, Fl. North. Terr. (1917) 222; Beumée, Hand. 3e Ned. Ind. Natw. Congr. (1925) 147; Heyne, Nutt. Pl. ed. 2 (1927) 1279; Markgr., Bot. Jahrb. 61 (1928) 177; White, Contr. Arn. Arb. 4 (1933) 91; Backer & Bakh. *f.*, Fl. Java 2 (1965) 226; Peekel, Fl. Bismarck Arch. (msc.) 1426. — *Blaberopus villosus* Miq., Fl. Ind. Bat. 2 (1856) 440, incl. var. *petiolatus*. — *A. subsessilis* Miq., Ann. Mus. Bot. Lugd.-Bat. 4 (1868) 140. — *A. longissima* F. v. M., Descr. Not. (1877) 91; White, Proc. R. Soc. Queensl. 34 (1922) 49; Lane-Poole, For. Res. Papua (1925) 135. — *A. villosa* var. *glabra* K. & V., Bijdr. 1 (1894) 123. — *A. somersetensis* F. M. Bailey, Queensl. Agr. J. 1 (1897) 229. — *A. villosa* f. *calvescens* Markgr., Bot. Jahrb. 61 (1928) 178.

Distribution. Malesia and Queensland.

JAVA. W e s t. Preanger: *Koorders 12302, 15710*, Sukabumi; *12333*, Pelabuan Ratu. — C e n t r a l. 7 collections, mainly from Pekalongan. — E a s t. 10 collections, mainly from Besuki. — N u s a B a r u n g. *Jacobs 4756*. — K a n g e a n A r c h. *Backer 27816, 27966*, G. Eteng near Tambajangan; *28154*, Kaju Waru; *28958*, Sepandjang.

LESSER SUNDA ISLANDS. L o m b o k. *De Voogd 2062*. — S u m b a w a. *Kostermans 18230, 18232, 19112*, Batu Lanteh Mts.; *Kuswata 252*, Parnek, Olat Seli. — S u m b a. *Iboet 9*, Pajeti; *266*, Lologooh; *484*, Mao Marru. — F l o r e s. *Kostermans & Wirawan 91*, base of Mt. Ndeki; *Schmutz 15, 33*, Rekas; *Verheijen 992, 993, 2687*. — R o t i. *Verheijen 2410*. — T i m o r. 7 collections. — B a b a r I s. *Van Borssum Waalkes 3086*, Letwurung. — T a n i m b a r I s. 7 collections.

BORNEO. N o r t h. *SAN 41342*, Kudat Distr., Loroh For. Res.

PHILIPPINES. L u z o n. *Elmer 14468*, Sorsogon, Irosin, Mt. Bulusan. — M i n d a n a o. *Elmer 10840*, Davao Distr., Todaya, Mt. Apo.

CELEBES. C e n t r a l. *NIFS Cel. II. 458*, Malili, Usu; *Rachmat 846*, Kp. Balandu. — S o u t h w e s t. *NIFS Cel. I. 44*, Bonthain. — S a l e ij e r. *bb 3685*. — K a l a o t u a. *bb* 22950, Lembego. — P. M o e n a. *bb 5849*, Wakadea.

MOLUCCAS. A m b o n. *De Fretes 5574* (U, type of *A. subsessilis* Miq.). — K a i I s. *Jensen 415*, Tual (L).

NEW GUINEA. 51 collections from all over the island, including also P. Japen, the Aru Is., New Britain, New Ireland, Woodlark I., Ferguson I., and Normanby I.

Cultivated Hort. Bot. Bogor IV. A. 82.

9. Alstonia muelleriana Domin

A. muelleriana Domin, Bibl. Bot. 89 (1928) 1081; Monach., Pacif. Sc. 3 (1949) 163. — *A. muelleriana* var. *parvifolia* Domin, l.c. — *A. villosa auct. non* Bl.: F. v. M., Fragm. 6 (1867) 117; Benth., Fl. Austr. 4 (1869) 313; F. M. Bailey, Queensl. Fl. 3 (1900) 986.

Distribution. Queensland, South New Guinea.

NEW GUINEA. W e s t. *BW 4855*, along R. Digoel, near Wage. — E a s t. Western Distr.: *Brass 6563*, Mabaduan; *7953*, middle Fly R., Lake Daviumbu; *8373*, lower Fly R., Gaima; *NGF 10388*, Oriomo R.,

8 50 S 143 15 E; *17739*, Oriomo Creek, mouth of Yakup Creek, 8 50 S 143 E; *33526*, *33726*, Bensbach Subdistr., Weam, 8 38 S 141 07 E; *Pullen 7148*, Morehead Patrol Post. — Southern Highlands Distr.: *NGF 39799*, Mendi Subdistr., Mendi Rd., 6 5 S 143 50 E. — Central Distr.: *NGF 7166*, Brown R., near Laloki Bridge; *Schodde 2745*, 8 miles N. of Kapakapa.

10. **Alstonia macrophylla** G. Don

A. macrophylla Wall. [Cat. (1829) n. 1648] *ex* G. Don, Gen. Syst. 4 (1837) 87; DC., Prodr. 8 (1844) 409; Miq., Fl. Ind. Bat. 2 (1856) 438; Hook. *f.*, Fl. Br. Ind. 3 (1882) 643; Hemsl., Bot. Chall. I, 3 (1885) 165; Boerl., Handl. 2 (1899) 395; Merr., Bull. Bur. For. Philip. 1 (1903) 48; K. & G., Mat. Fl. Mal. Pen. (1907) 439; Merr., En. Born. (1921) 497; En. Philip. 3 (1923) 322; Ridl., Fl. Mal. Pen. 3 (1923) 347; Lane-Poole, For. Res. Papua (1925) 135; Pitard, Fl. Gén. I.-C. 3 (1933) 1162; Kerr, Fl. Siam. En. 2 (1939) 440; Corner, Ways. Trees (1940) 142; Monach., Pacif. Sc. 3 (1949) 164; Quis., Med. Pl. Philip. (1951) 720; Burk., Dict. (1966) 114. — [*Cofassus citrina* Rumph., Herb. Amboin. 3 (1743) 30, tab. 15; Merr., Int. Rumph. (1917) 427]. — *A. macrophylla* var. *glabra* DC., l.c. — *A. costata* Wall. [Cat. (1829) n. 1649] *ex* Miq., Fl. Ind. Bat. 2 (1856) 439, *non* R. Br., 1811. — *A. batino* Blanco, Fl. Filip. ed. 2 suppl. (1845) 589; Merr., Publ. Gov. Lab. Philip. 27 (1905) 59. — *A. acuminata* Miq., Ann. Mus. Bot. Lugd.-Bat. 4 (1869) 140. — *A. subsessilis* Miq., l.c. — *A. pangkorensis* K. & G., Mat. Fl. Mal. Pen. (1907) 442; Ridl., Fl. Mal. Pen. 2 (1923) 348. — *A. paucinervia* Merr., Philip. J. Sc. Bot. 5 (1910) 224, En. Philip. 3 (1923) 322. — *A. oblongifolia* Merr., Philip. J. Sc. Bot. 10 (1915) 65; En. Philip. 3 (1923) 322. — *A. macrophylla* var. *mollis* Merr., En. Philip. 3 (1923) 322. — *A. macrophylla* var. *acuminata* (Miq.) Monach., Pacif. Sc. 3 (1949) 166.

Distribution. From Indo-China and Thailand to the Moluccas.

MALAY PENINSULA. Perak. *KEP FRI 974*, Lumut For. Res. — Kelantan. *Corner 33422*, Kedai Bahru, near Kota Bahru. — Trengganu. *Corner s.n.*, Kuala Trengganu, 26—4—1937 (SING). — Selangor. *KEP FRI 20*, Telok For. Res. — Langkawi Islands. *Batten Pooll s.n.*, —2—1940 (SING). — P. Penang. *Corner 31950*, Penang Hill; *Curtis 378*, Government Hill; *KEP 98132*, Georgetown Bot. Garden; *KEP FRI 281*, Penang Hill; *SF 39123*, Feltes Rd.

SUMATRA. Biliton. *Anonymous 84* (L).

BORNEO. North. 18 collections. — Banguey Island. *SAN 25756*.

PHILIPPINES. Palawan. *Elmer 12929*, Puerto Princesa, Mt. Pulgar. — Luzon. 23 collections. — Romblon. *Elmer 12157*. — Guimaras. *PNH 11731*.

CELEBES. North. *Koorders 16044*, Menado.

MOLUCCAS. Ceram. *Buwalda 5640*, Kp. Kiandarat, G. Kilia. — Ambon. *Robinson Pl. Rumph. 77*.

Cultivated. Hort. Bot. Bogor IV.A.55 & 65 (=*Kostermans 11141*).

11. **Alstonia brassii** Monach.

A. brassii Monach., Pacif. Sc. 3 (1949) 166; Van Royen *et al.*, Man. For. Trees Papua & N.G. 9 (without year) 12, f. 5.

NEW GUINEA. Vogelkop Peninsula. *BW 15260*, Ajamaru. — Indonesian North. *BW 3682*, Hollandia; *Kostermans & Soegeng 206*, Dozai (E. of Hollandia). — Southeast. Southern Highlands Distr.: *Schodde 2165*, Lake Kutubu, near Tage. — Central Distr.: *Carr 14541*, Boridi; *Darbyshire 883*, Kairuku Subdistr., Maipa airstrip. — Northeast. 20 collections. — D'Entrecasteaux Islands. Normanby I.: *Brass 25379*, Waikaiuna; *25840*, Lebudowa R. — New Britain. *NGF 21911*, Kandrian Subdistr., Piriloma Village. — New Ireland. *NGF 46090*, Namatanai, Danfu R. area, inland from Manga, 4 13 S 153 E. — Schouten Islands. Biak: *BW 83410*, Kg. Landbouw; *12036*, Oregon trail; *Nicolson 1568*, Mokmer Airport (L). — P. Japen. *Aet & Idjan 638*, Kamioraro (near Serui); *bb 30363*, Serui. — Noemfoor. *BW 1070*, Namber. — P. Waigeo. *Van Royen 5405*, SE. of Kabaré on the path to Kambelé Hills.

12. **Alstonia glabriflora** Markgr.

A glabriflora Markgr., Bot. Jahrb. 61 (1928) 179; Monach., Pacif. Sc. 3 (1949) 167; Van Royen *et al.*, Man. For. Trees Papua & N.G. 9 (without year) 14, f. 6.

NEW GUINEA. Vogelkop Peninsula. *BW 7662*, Manokwari, Sidei. — Southeast. 11 collections. — Northeast. 20 collections.

Presumed hybrid **Alstonia brassii x spectabilis**

Tree up to 32 m. *Leaves* in whorls of 3 or 4, obovate-elliptic, 7—20 by 2—7 cm, glabrous; lateral nerves rather straight, 12—15 pairs, 6—15 mm distant; petiole 0,5—1.5 cm. *Inflorescenses* divaricate, peduncle none, branches 1—4 cm, bearing one pleiochasium each. Pedicels 1—2 mm, all parts pubescent to tomentose. *Calyx* tube 1—1.5 mm, lobes ovate, obtuse, either 1 by 1 mm or 1.5 by 1.2 mm, either densely tomentose outside and inside or sparsely to densely pubescent outside, glabrous inside, and ciliate. *Corolla* tube either 2 mm or 4 mm, either papillose outside or glabrous with 5 pilose lines, lobes oblong, obtuse, glabrous, either 1,2 by 0.8 mm or 2.4—3 by 1.2 mm, their bud either obtuse or acutish. *Ovary* glabrous, 0.5—0.7 mm. *Follicles* glabrous, 400 by 4 mm. *Seeds* 4 by 1.5 mm, hairtufts 10 mm. Embryo well developed, cotyledons oblong, 1.5 by 0.5 mm, radicle 1.2 by 0.3 mm.

NEW GUINEA. Vogelkop Peninsula. *BW 5688, 12336*, Warsamson Valley (25 km E. of Sorong); *5783*, Sidei (50 km W. of Manokwari). — P. Japan. *BW 11102*, Sumberbaba. — P. Waigeo. *Van Royen 5333*, eastern peninsula, Pig R., SW. of Kabaré; *5535*, Go Isthmus, between Puan and Tofak Bay.

The characters marked 'either' refer to *Van Royen 5535*, the characters marked 'or' refer to *Van Royen 5333, BW 5783*. The glabrous corolla parts with acutish bud may be attributed to *A. brassii*, the hairiness of the calyx and corolla parts to *A. spectabilis*. Thus *Van Royen 5535* stands nearer to *A. spectabilis*, the others nearer to *A. brassii*. Both species meet in New Guinea.

EXCLUDED SPECIES

Alstonia costulata Miq., Sum. (1860) 229, 556 = **Dyera costulata** (Miq.) Hook. *f.*
A. eximia Miq., o.c. 229, 555 = **Dyera costulata** (Miq.) Hook. *f.*
A. ficifolia Sp. Moore, J. of Bot. 61 (1923) Suppl. p. 32 = **Ochrosia ficifolia** (Sp. Moore) Markgr.
A. grandifolia Miq., o.c. 229, 555 = **Dyera costulata** (Miq.) Hook. *f.*
A. micrantha Ridl., J. Str. Br. R. As. Soc. 79 (1918) 95; Fl. Mal. Pen. 2 (1923) 347 = **Chilocarpus embelioides** K. & G.
A. polyphylla Miq., o.c. 229, 556 = **Dyera polyphylla** (Miq.) Steen.
A. sericea Bl., Bijdr. (1826) 1038 = **A. neriifolia** D. Don. This species is not indigenous in Malesia, seems to have been cultivated in Java, however.